Electronic Version
Stylesheet Version v1.1.1

# Claims

[c1] 1.- A system for preventing electric arcs in connectors feeding power loads, which connectors (11), interspersed in an electric power supply and distribution network, are of the type comprising first and second releasable socket coupling electroinsulating connection supports (1, 2) bearing at least one pair of terminals (3, 4) which, in a first definitive coupling position A, are electrically coupled together, forming an electric power through channel (5, 6) towards a corresponding power load (10), and which terminals (3, 4) in a second decoupling position C of the electroinsulating connection supports (1, 2) are physically separated, the voltage level of said network being such that said separation can generate an electric arc, characterized in that each one of said connections (11) comprises at least a pair of additional electroconductive elements (12, 13) for detection purposes which, in said first position A, or in intermediate position B of a decoupling run between the electroinsulating connection supports (1, 2) and before said terminals (3, 4) reach said second position C, form an auxiliary electric circuit (14, 15) through which it is susceptible to generating an electric warning signal in correspondence with a dis-

placement of the supports (1, 2) towards a decoupling situation and upon overcoming a preset threshold in the decoupling run, and in that at least one disconnection protection device (7) has been provided, connected to said auxiliary circuit (14, 15), prepared so that upon receiving said electric warning signal, it immediately interrupts the electric fed to said channel (5, 6) formed by said two terminals (3, 4) before the latter reach said second position C of physical separation between them.

[c2] 2.- A system according to the previous claim, characterized in that said connectors (11) are multi-contact connectors which, through a series of pairs of power terminals (3, 4), form a plurality of feed channels (5, 6) of several respective power loads (10a, 10b, ...), and in that each connector (11) integrates two electroconductive detection contact terminals or parts (13, 14), susceptible to forming said auxiliary circuit (14, 15) in said first position A, or in intermediate position B of a decoupling run between the electroinsulating connection supports (1, 2) and before said terminals (3, 4) reach said second position C.

[c3] 3.- A system according to claim 2, characterized in that each one of the connectors (11) comprises several pairs of power terminals (3, 4) and a pair of addition terminals (12, 13) for defining said auxiliary circuit, all of which

terminals are male pin and female base pairs arranged on the first and second electroinsulating connection supports (1, 2) in respectively facing positions, wherein all male pins are of equal length and/or are arranged at the same level, whereas the female base of the pair of detection terminals (12, 13) is shorter or is more withdrawn than the female base of the pair of power terminals (3, 4).

[c4] 4.- A system according to claim 2, characterized in that each one of the connectors (11) comprises several pairs of power terminals (3, 4) and a pair of terminals (12, 13) for defining said auxiliary circuit, which terminals are male pin and female base pairs arranged on the first and second supports (1, 2) in respectively facing positions, wherein all female bases are of equal length and/or are arranged at the same level, whereas the male pin of the pair of detection terminals (12, 13) is shorter or is more withdrawn than the male pin of the pair of power terminals (3, 4).

[c5] 5.- A system according to claim 2, characterized in that each one of the connectors (11) comprises several pairs of power terminals (3, 4) and a pair of terminals (12, 13) for defining said auxiliary circuit, which terminals are male pin and female base pairs arranged on the first and second supports (1, 2) in respectively facing positions,

one of the supports (1) or male body having a stepped recess in correspondence with the position of the pin (12) or (13), such that the pin is more withdrawn with regard to the remaining terminals of the connector (11).

[c6] 6.- A system according to claim 2, characterized in that each one of the connectors comprises several pairs of power terminals (3, 4) and a first one of the electroinsulating connection supports (1), or male body, carries on its side wall an electroconductive part (30), whereas in the cavity of the second connection support (2), or female body, two branches (31a, 31b) of an electric circuit are arranged, which end in two spaced conductive strips (32a, 32b) which open into a cavity of the side wall of support (2), such that in the decoupling run, the part (30) is arranged on said cavity, connecting said strips (32a, 32b), closing the circuit formed by the branches (31a, 31b) and through which the sending of the warning signal is generated towards the disconnection device (7) of feed to the conductive channels formed by said power terminals (3, 4) before reaching physical separation thereof.

[c7] 7.- A system according to claim 2, characterized in that said disconnection protection device (7), of which there is at least one, is integrated in an electronic unit (20) or distribution box which controls a plurality of connectors

(11b, 11c, 11d, 11e) and which unit (20) comprises a circuit (16) for identification of the connector or connectors (11) in transition towards decoupling position B, which circuit (16) is connected to a microprocessor (8) controlling said disconnection protection device (7) linked to the electric power feed source and from which several corresponding circuits or channels are formed which pass through a distribution connector (11e) and from which they branch off towards the corresponding connectors (11) and their electrically coupled terminals (3, 4).

[c8] 8.- A system according to claim 7, characterized in that through said distribution connector (11e), a line of the corresponding auxiliary circuit (14, 15) of each connector (11) is received, which lines are fed to said connector identification circuit (16) which, according to which is the connector (11) from which the warning signal is received, acts on the microprocessor (8) by sending a preferential interruption which generates a corresponding order to the disconnection protection device (7) to disconnect the feed towards the power channel or lines passing through the corresponding connector (11).

[c9] 9.- A system according to claim 8, characterized in that between each load (10a, 10b) and the electronic unit (20), one or more connectors (11b-11e) are inter-

spersed, each one of said connectors (11b-11e) including one of said pairs of detection terminals (12, 13), by which the number of terminals present in each connector (11b-11e) increases the closer the connector is to the electronic unit (20).

[c10] 10.- A system according to claim 8, characterized in that a first one of the detection terminals (13) of said pair of terminals (12, 13) of each connector (11) is fed at a voltage not susceptible to generating an electric arc, and the second one of the detection terminals (12) is connected by means of a conductor (15) to said disconnection identification circuit (16), each one of which elements of said pair of detection terminals (12, 13) is provided with a configuration such that they carry out an interruption in the connection or a permanent disconnection between said voltage not susceptible to generating an electric arc and the disconnection identification circuit (16) before the disconnection of the pair of power terminals (3, 4) occurs.

[c11] 11.- A system according to claim 10, characterized in that one of the detection terminals (13) of said pair of terminals (12, 13) of each connector (11) is connected to a ground connection (14), each disconnection identification circuit (16) being informed of said interruption in the connection or permanent disconnection of the pair of

detection terminals (12, 13) due to the change from a minimum self-impedance situation, distinctive of the connection to said ground connection (14), to a maximum impedance situation in the conductor (15).

[c12] 12.- A system according to claim 1, characterized in that said first and second electroinsulating connection supports (1, 2) of each connector (11) comprise mechanical closure means of mutual coupling thereof by virtue of which their decoupling is carried out in two steps: a first step in which a displacement is produced until overcoming a threshold in the decoupling run which generates a permanent disconnection or connection of the pair of electroconductive detection elements (12, 13), and a second step in which the disconnection of the pair of power terminals (3, 4) from their feed is produced.

[c13] 13.- A system according to claim 1 or 7, characterized in that said disconnection protection device (7) is made up of a power relay.

[c14] 14.- A system according to claim 1 or 7, characterized in that said disconnection protection device (7) is constituted of an FET power transistor.

[c15] 15.- A method for preventing electric arc formation in connectors feeding power loads, which connectors (11),

interspersed in an electric power supply and distribution network, are of the type comprising first and second releasable socket coupling electroinsulating connection supports (1, 2) bearing at least one pair of terminals (3, 4) which, in a first definitive coupling position A, are electrically coupled together forming an electric power through channel (5, 6) towards a corresponding power load (10), and which terminals (3, 4), in a second decoupling position C of the electroinsulating connection supports (1, 2), are physically separated, the voltage of said network being such that said separation can generate an electric arc, characterized in that it comprises the provision in each one of said connectors (11) of at least one pair of electroconductive elements (12, 13) for detection functions which, in said first position A or in intermediate position B of a decoupling run between the electroinsulating connection supports (1, 2) and before said terminals (3, 4) reach said second position C, form an auxiliary electric circuit (14, 15), and in that through said auxiliary circuit and depending on a change in the conditions thereof, such as a connection or disconnection situation, an electric warning signal is generated in correspondence with a displacement of the released supports (1, 2) towards said position C, and upon overcoming a preset threshold in the decoupling run, which signal is sent to at least one disconnection protection de-

vice (7) which, upon receiving said electric warning signal, immediately interrupts the electric feed to said channel (5, 6) formed by said two terminals (3, 4) before these reach said second physical separation position C.

[c16] 16.- A method according to claim 15, characterized in that in the distribution network, there is a plurality of connectors (11) feeding different power loads, and in that said electric warning signal, generated from said (11) auxiliary circuit (14, 15), is sent to a circuit (16) for identification of the connector (11) affected by a transition towards decoupling, and in that from said circuit (16), a preferential interruption is generated to a microprocessor (8) which acts on a disconnection protection device (7) which selectively cuts off the electric feed to said connector (11) at hand.

[c17] 17.- A connector for feeding a power load, provided for its incorporation in a feed line of said load, of the type constituted of first and second releasable socket coupling electroinsulating connection supports (1, 2) bearing at least one pair of terminals (3, 4) which, in a first definitive coupling position A, are electrically coupled together forming an electric power through channel (5, 6) towards a corresponding power load (10), and which terminals (3, 4), in a second decoupling position C of the electroinsulating connection supports (1, 2), are physi-

cally separated, the voltage level of said network being such that said separation can generate an electric arc, characterized in that said connector (11) comprises at least one pair of additional electroconductive elements (12, 13) for detection functions which, in said first position A, or in intermediate position B of a decoupling run between the electroinsulating connection supports (1, 2) and before said terminals (3, 4) reach said second position C, form an auxiliary electric circuit (14, 15) through which an electric warning signal is susceptible to being generated in correspondence with a displacement of the supports (1, 2) towards a decoupling situation and upon overcoming a preset threshold in the decoupling run.